Thesis/
Reports
Shaw,
W. W.

RECREATIONAL AND SCIENTIFIC ACTIVITY IN CAVE CREEK CANYON, CHIRICAHUA MOUNTAINS, ARIZONA, 1978-1979

William W. Shaw, Tamsie Cooper & Merton T. Richards

RECREATIONAL AND SCIENTIFIC ACTIVITY IN CAVE CREEK CANYON, CHIRICAHUA MOUNTAINS, ARIZONA, 1978-1979

William W. Shaw, Associate Professor
Tamsie Cooper, Research Associate
and
Merton T. Richards, Research Associate

Final Report
Prepared for the
CORONADO NATIONAL FOREST
U.S. DEPARTMENT OF AGRICULTURE,
FOREST SERVICE
TUCSON, ARIZONA

July 1979

LIBRARY COPY
ROCKY MT. FOREST & RANGE
EXPERIMENT STATION

INTRODUCTION

The study described in this report was completed as part of a larger investigation of non-consumptive uses of wildlife in southeastern Arizona (Shaw, William W. and David A. King, 1976).[1] Previous phases of the larger study have focused on nonhunting wildlife enthusiasts using a variety of areas in southeastern Arizona (Shaw et al. 1978, Witter et al. 1978, Richards et al. 1979). In these earlier studies it became clear that Cave Creek Canyon, in the Chiricahua Mountains of the Coronado National Forest, is a major focal point for wildlife appreciation activities. However, very little specific information about these wildlife-oriented activities and their implications for natural resource managers was available. Therefore, a comprehensive, year-long study of recreation in Cave Creek Canyon was initiated. This report provides a general description of all the recreaional activities occurring in this area. In addition, it examines the relationships between wildlife-oriented recreation and the other recreational as well as scientific activities that occur in the canyon.

METHODS

This report is based on results from personal interviews of 1271 parties of recreationists conducted between May 1978 and April 1979 in Cave

---

[1]Financial assistance for this research was provided by McIntire-Stennis Forestry Project ARZT 2016-4188-03, the Rocky Mountain Forest and Range Experiment Station, Forest Service Project No. 16-682-GR, and by the Coronado National Forest.

Creek Canyon. A roadblock located just east of the Portal Ranger Station was utilized to stop each party of recreationists departing from the area. This roadblock was operated between the hours of 8:30 a.m. and 5:00 p.m. by trained interviewers on 54 different days during the study period. Interviewers were in the field at least two weekend days and two weekdays during each month of the year with the exception of January 1979. During that month, interviews were conducted on only one weekend day and one weekday due to inclement weather and flood damage to the roads.

In addition to the Portal road, people have access to Cave Creek Canyon via a graded road over Onion Saddle. In order to estimate numbers of people using the canyon, it was necessary to determine what percentage of visitors to the area depart via the Onion Saddle road and consequently would be missed by the Portal survey station. To do this, a second roadblock survey station was established approximately one-half mile west of the Southwest Research Station on the Onion Saddle road. This station was operated simultaneously with the Portal station on 27 different days from May 1978 through December 1978. (In late December 1978, this road was closed due to storm damage and was not reopened during the study period.)

RESULTS

Recreational Use Estimates

Recreational use estimates were developed based on monthly averages for numbers of parties interviewed at the Portal survey station. Monthly estimates were stratified by weekend versus weekday survey days and corrected for the percentage of parties that depart via the Onion Saddle road and who were not surveyed. (On the basis of 27 days in which surveys were conducted at both Onion Saddle and Portal survey stations, approximately 38 percent of

visitors to Cave Creek Canyon depart over Onion Saddle.) The formulas for calculation of monthly and annual use estimates are presented below.

Monthly use estimates:

$(\overline{X}_{we})$ x (actual weekend days in month) x (Onion Saddle Correction Factor) + $(\overline{X}_{wd})$ x (actual weekdays in month) x (Onion Saddle Correction Factor)

Where: $\overline{X}_{we}$ = Average number of parties departing on weekend days

$\overline{X}_{wd}$ = Average number of parties departing on weekdays

Onion Saddle Correction Factor = 1.38

The annual use estimate = the sum of the monthly use estimates.

Using these procedures, annual recreational use of Cave Creek Canyon during the study year was estimated to be approximately 7,100 parties. Since the average party consisted of 3.1 people approximately 22,000 recreationists visited the area during the year. The average party stayed in the area for 3.74 days yielding an annual use estimate of approximately 82,000 visitor days.

These use estimates should be considered approximate. Three important possible sources of error are:

1. Parties leaving the area before or after survey hours (8:30-5:30) were not included in these calculations. Therefore, use estimates may be somewhat lower than actual use.
2. From January 1979-April 1979, the road over Onion Saddle was closed due to storm damage. It is not known what effect this had on recreational use of the canyon.
3. The average length of stay figure (3.74) includes a few parties staying up to 120 days (mostly scientists who also used the area for recreational purposes). This would tend to slightly inflate use estimates.

The distribution of recreational use on a monthly basis is presented in Figure 1. Recreational use reached its maximum in May when over 1300 parties visited the area. The minimum activity occurred in January when use was estimated at only 66 parties for the entire month.

Recreational Party Characteristics

The size of recreational parties ranged from 1 to 27 with an average of 3.1 people per party. Forty-two percent of the parties were family groups; 23 percent friends; 15 percent couples; 11 percent single individuals; and 7 percent were larger groups. Approximately 45 percent of the parties were visiting during the day only with the remainder spending at least one night. Overnight visitors stayed at a variety of campgrounds and other facilities in the canyon (Table 1).

User Characteristics

Most recreationists are repeat users of Cave Creek Canyon with two-thirds of the users having visited Cave Creek Canyon previously. People come to Cave Creek Canyon for a variety of reasons primarily dealing with its physical and biological resources. One item on the survey asked people to indicate what they consider most appealing about the area. The results are presented in Table 2.

Another approach to understanding why people come to Cave Creek Canyon is to examine the activities in which they engage. Respondents in this study were asked: "What is the primary activity engaged in (will engage in) while here?" The results are presented in Table 3. The most frequently cited activities were picnicking, relaxing, and related day uses (22.1 percent); hiking and backpacking (21.5 percent); and wildlife and nature observation (17.5 percent). This last category of activities was further analyzed with

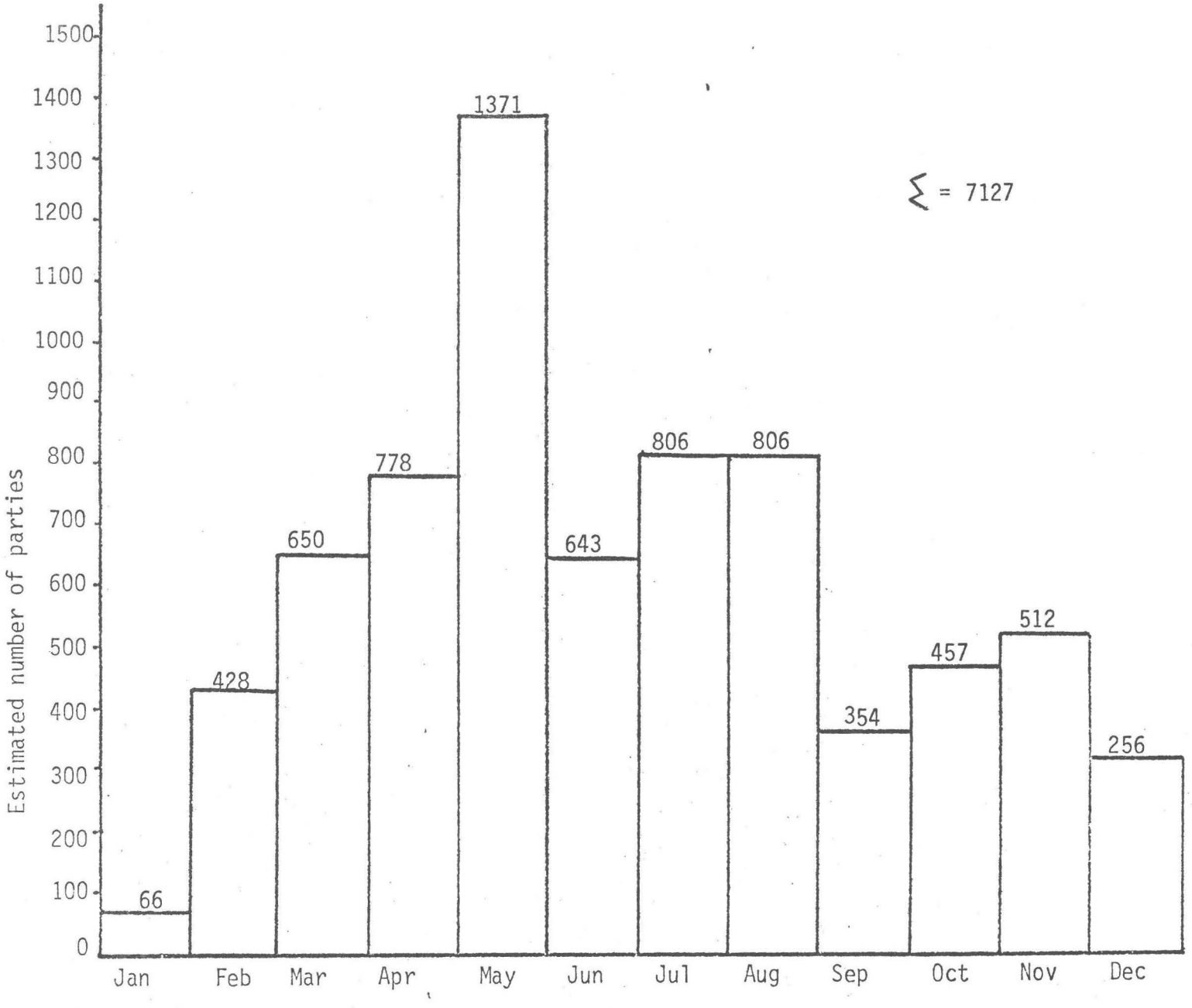

Figure 1. Estimated number of recreation parties using Cave Creek Canyon May 1978- April 1979

Table 1. Location of overnight visits to Cave Creek Canyon, May 1978-April 1979.

Location	n	%
Sunny Flat	138	20.3
Cave Creek Ranch Motel	77	11.3
Stewart	69	10.2
Southwest Research Station	66	9.7
South Fork	58	8.5
Idlewild	51	6.5
Dispersed locations (in Cave Creek Canyon)	32	4.7
Herb Martyr	29	4.3
Multiple locations (in Cave Creek Canyon designated camping areas)	20	2.9
John Hand	14	2.1
Back country	13	1.9
Other areas (not in Cave Creek Canyon, including Rustler Park, etc.)	113	16.6
	680	

Table 2. Most appealing characteristics of Cave Creek Canyon area reported by recreationists surveyed May 1978-April 1979.

Most Appealing Characteristic	n	%
Beauty, scenery, etc.	283	22.5
Wildlife, biological diversity, natural history, etc.	252	22.0
Cool climate, water, stream, riparian environment, etc.	220	17.5
Quiet, remote, few people, primitive,etc.	193	15.3
Geology, mountains, etc.	143	11.3
Other	167	13.2
	1258	

Table 3. Primary recreational activities of recreationists surveyed in Cave Creek Canyon, May 1978-April 1979.

Primary Activity	n	%
Picnicking, relaxing, getting wet, drinking, etc. (primarily day use)	280	22.1
Hiking, backpacking, etc.	272	21.5
Wildlife observation, birding, nature study, nature photography, etc.	221	17.5
Driving for pleasure, sightseeing, etc.	216	17.1
Camping	134	10.6
Hunting	36	2.9
Other	98	7.7
	1257	

the results presented in Table 4. It can be seen that birdwatching accounts for most of the wildlife-oriented activities (74 percent).

The seasonal variation of these activities is presented in Figure 2. Although on an annual basis picnicking and relaxing are most frequently cited activities, at certain times of the year other activities become more important. For example, during the month of heaviest use (May) wildlife observation and related activities were most frequently cited by recreationists; driving for pleasure and sightseeing are most important in February; and hunting is most important in November.

One item on the survey asked if visitors had any comments or concerns about the management of Cave Creek Canyon. Apparently, users are generally satisfied. Forty-four percent had no comment at all and an additional 24 percent commented that they were pleased or satisfied with the current situation. Another comment made by a significant number of respondents (7 percent) was that the area should be left as it is. One of the major management issues for the Forest Service is to determine how South Fork should be managed. However, only 24 people (2 percent) in this study mentioned South Fork specifically and of these 17 wanted the road closed and 6 wanted things left as they are. A summary of management-related comments is provided in Table 5.

Scientific Activities

The same natural resources that attract recreators to this area have attracted a large number of scientists to the region. In fact, Cave Creek Canyon and its surrounding environs has become a major center for a wide variety of scientific activities. Since the value of this area for both recreation and scientific studies is dependent on maintaining the quality of the same

Table 4. Wildlife related activities reported as primary recreational activities by respondents surveyed in Cave Creek Canyon, May 1978-April 1979.

Activity	n	%
Birdwatching	164	74
Nature photography	20	9
Nature observation	20	9
Wildlife observation	17	8
	221	

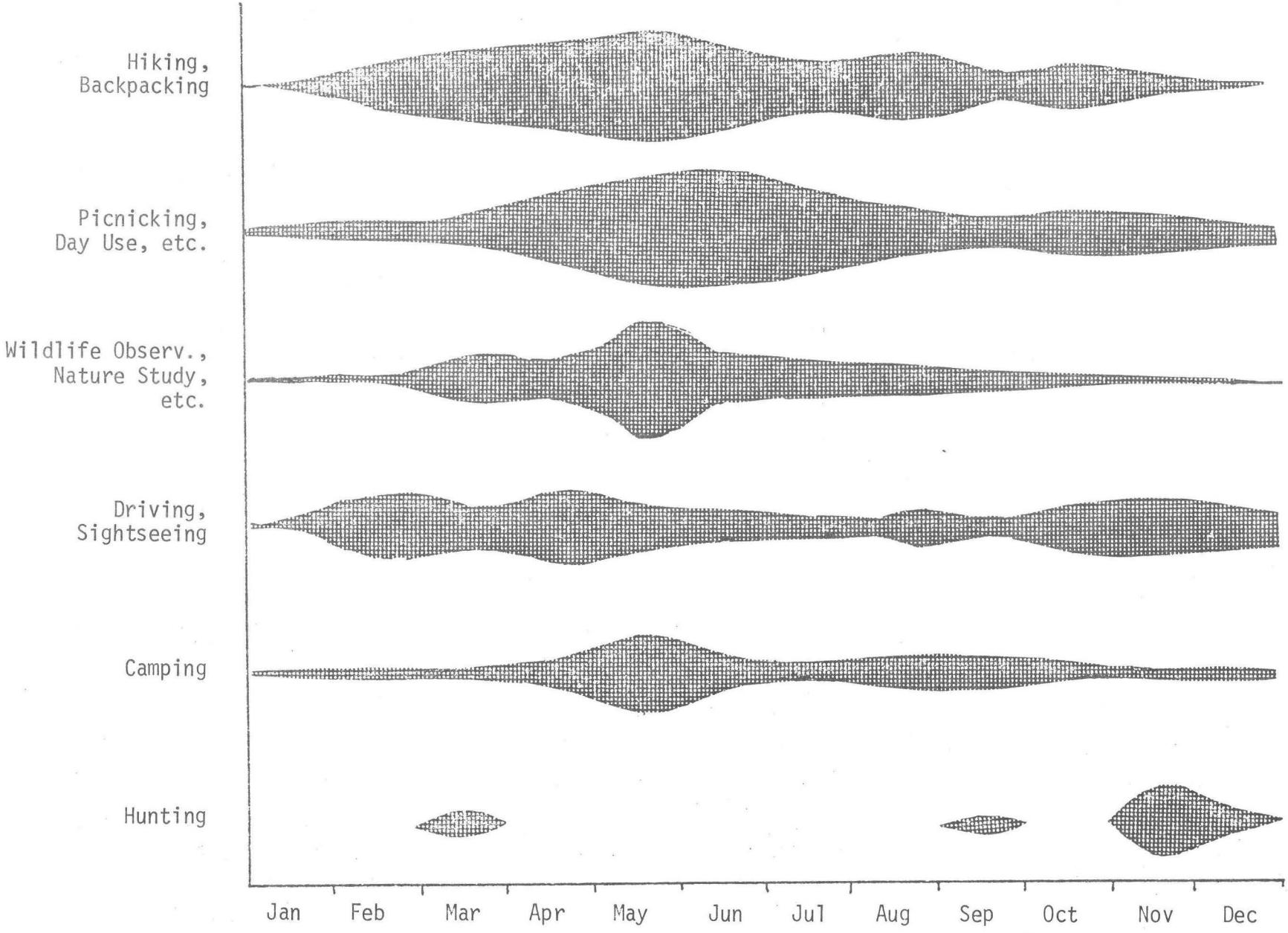

Figure 2. Seasonal distribution of recreation activities in Cave Creek Canyon, May 1978-April 1979.

Table 5. Frequently cited management-related comments by respondents surveyed in Cave Creek Canyon, May 1978-April 1979.

Comment	N
Provide personnel for assistance and information	10
Provide additional day use sites	27
Post "Campground Full" signs to cut down traffic and dust when sites are not available	20
Provide written information on camping facilities, trails, history, plant and animal life	18
Leave the canyon as is	94
Satisfied with management	309
No comments	503
Close South Fork road	17
Leave South Fork road as is	6
	1,004

resource base, it is important to describe the extent of these studies and discuss their relationship to recreation in the area.

Most (but not all) of this research is conducted by individuals associated with and/or using the facilities of the American Museum of Natural History's Southwest Research Station. Therefore, an examination of the records of this facility provides a good description of the scientific activities in Cave Creek Canyon.

During the study period (May 1978-April 1979) almost 1100 scientists, students, and naturalists and their families utilized the Southwest Research Station. They included 164 scientists and their assistants from 65 different scientific institutions, 184 students and professors in 13 different college and university classes, and 747 naturalists and their families.

The resources of the region are the subject of a tremendous diversity of scientific studies (Tables 6 and 7). Since the establishment of the research station in 1955, there has been a steady increase in the scientific activities of the station and the international reputation of the area as a center for natural history investigations.

DISCUSSION

A discussion of the management implications of these results should incorporate a variety of issues. The significance (local, regional, national, or international) of the different resources in the area should be considered as should the preferences and characteristics of the users. In addition, current or potential conflicts among users as well as current and potential impacts of users on the resources should be discussed.

Table 6. Categories of investigations conducted at the Southwest Research Station May 1978- April 1979.

Category	Number of Investigations
Animal behavior (insects, mammals, lizards, birds)	21
Entomology	20
Herpetology	12
Geology	9
Botany	7
Ecology	6
Ornithology	6
Archeology	2
Miscellaneous	7
	90

Table 7. Examples of studies conducted at Southwest Research Station, May 1978-April 1979.

Ecology of wasps
Dominance in Mexican jay flocks
Variations in reproductive systems in the plant *Oxalis*
Geology of the North Chiricahua Mountains
Petrology of intrusive and eruptive rocks
Geological study of cretaceous rock
Maturation of fence lizards
Function of the tongue in fence lizards
Metabolism of free-ranging lizards
Ethology of myremecophile beetles
Sexual behavior of Romaleine grasshoppers
Twig nesting hymenoptera
Behavioral studies in meloidae
Ecology of Hymenopteran parasitoids
Systematics and behavior of gyrind beetles
Tracking methods for jackrabbits and cottontails
Dense breeding population of Western and Cassin's kingbirds

The Resources

There appear to be three general characteristics of Cave Creek Canyon which attract most of its recreational users. Two are actual characteristics of the resource base. The third is a function of the location and management of the area.

One of the important resource-based characteristics might be described as the general environment: cool canyon, large trees, water, and scenic grandeur. In the arid Southwest, riparian habitat (particularly if it is associated with superlative scenic beauty as is the study area) is inevitably a focal point for recreation. While there are other riparian areas in the Southwest, numbers are quite limited. Furthermore, the exceptional scenic beauty of Cave Creek Canyon along with the availability of camping facilities contribute to the appeal of the area. The general environmental characteristics of this area then are certainly of regional significance. People come to the area from throughout the Arizona, New Mexico, and western Texas region primarily because of these general environmental qualities.

A second important category of resources in Cave Creek Canyon is the unique and exceptionally diverse biota of the area. As shown in Tables 2 and 3, a significant number of recreationists as well as scientists come to this area primarily due to its biological resources. There is no doubt that for both amateur naturalists (birdwatchers, etc.) and professional biologists Cave Creek Canyon has national significance. There are many wildlife species for which southeastern Arizona is the northernmost extent of their range and Cave Creek Canyon has a national and perhaps international reputation among wildlife enthusiasts. Likewise the exceptionally diverse and relatively undisturbed biota of the area attracts research biologists from throughout the country.

The third general category that most often was cited as a major attraction of the area is a function of its location and management policies. This is the lack of crowding, the quietude, and lack of modern facilities. While this characteristic alone is of no major significance on a regional or national level, it certainly contributes to resource-based attractiveness of the area.

The Recreational Users

Most recreational users of Cave Creek Canyon seem to fall into two general categories: those attracted primarily by the general characteristics of the area, and those attracted primarily by its biological diversity.

One type of user comes to the area for the riparian habitat and scenic grandeur. These people enjoy the pleasing settings for picnicking, socializing, hiking, and other activities. The specific details of the biota are much less important than the general environmental characteristics (shade, water, adequate facilities, general scenery, etc.). Many of these people are day users and come from nearby communities including Willcox and Douglas, Arizona; Rodeo and Lordsburg, New Mexico; and Agua Prieta, Sonora. Other people (primarily overnight visitors) come from throughout the general region to enjoy these general environmental characteristics.

A second major group of users has a specific orientation toward the biological resources of the area. These people (primarily birdwatchers, but including all types of naturalists) come from throughout the United States and occasionally even other countries. They have come primarily because of the reputation of the area's unique and diverse biota.

It should be stressed that these two types are really extremes on a continuum. There is no doubt that the general environmental characteristics of the area are important to all but the most narrowly oriented bird lister and that likewise, the biological diversity of the area contributes to the enjoyment of most recreational users.

Conflicts Among Recreationists

In spite of the different orientation of these two major types of recreational users they appear to be for the most part compatible. Only very occasionally were complaints voiced about other recreators in the area. The only significant area of conflict appears to be focused on competition for the limited supply of facilities in the area. Almost all of the Forest Service facilities are designated for camping and yet nearly 50 percent of the use of the area is by day users. During periods of high use this presents a problem and becomes a source of conflict between day users and campers.

One other potential area of conflict is between sport hunting and other activities in the canyon. However, almost all hunting occurs during relatively low use periods. Furthermore, due to the distribution of buildings within the canyon, hunting is illegal throughout the lower canyon bottom. Therefore, what conflicts do exist between hunting and other uses of the canyon are primarily due to inadequate enforcement of existing laws.

Recreational Impacts on Resources

This study did not focus specifically on recreational impacts on the area's natural resources. However, several points can be made on the basis of our contacts with users and observations of their activities.

The general environmental characteristics of the area are relatively safe from major recreational impacts. Given present patterns of use as well as maintenance of the existing facilities by the Forest Service, the appeal of the area for general outdoor recreation should be secure.

The biological resources, however, are more vulnerable. There were occasional reports of direct impacts of people on wildlife such as photographers building blinds too close to nesting birds. However, the greatest threat to

these resources seems to be the level of recreational activities of all types in the canyon. Certain of the wildlife species which make the area so attractive to natural history enthusiasts may be intolerant of extensive human activity. Unfortunately, very little is known about the tolerance of specific types of wildlife to recreational activities. This is an area that warrants more research.

RECOMMENDATIONS

Cave Creek Canyon is a unique and valuable recreational and scientific resource. Resource managers are faced with the difficult challenge of protecting this resource and providing opportunities for human benefits. The following is a list of specific recommendations concerning several current management issues.

A. South Fork Canyon

South Fork Canyon, more than any other part of the Cave Creek area, is the focal point of scientific research and biology-oriented recreation. This area should be designated as a National Zoological Area and managed primarily for these activities. We do not, however, recommend closing the road. Such an action would greatly reduce the numbers of people benefiting from using the resource and is not warranted given current evidence of recreational impacts. There are, however, less drastic measures that could help to insure that the use of South Fork is compatible with the protection of its resources. Specifically, we recommend that the camping area be converted for day use only and that the tables and fire pits be removed. Rest rooms, trash bins, and parking facilities should remain.

B. Day Use Facilities

In order to reduce conflicts between day users and campers, specific areas should be designated for day use only. Here are three possible ways of doing this:

1. Develop additional day use facilities elsewhere on the eastern slope of the Chiricahuas. Since much of the day use of Cave Creek Canyon is not primarily oriented toward biological resources, it would be desirable to provide comparable opportunities elsewhere in the region.
2. Conversion of some of the existing camping facilities particularly in the John Hand-Herb Martyr area to day use-only sites. It may be possible to convert a small portion of existing camping sites to day use only without significantly reducing camping opportunities.
3. Development of new day use facilities in Cave Creek Canyon. There may be a few new locations in which day use facilities can be provided. However, in order to protect the resources of the area and maintain its present character, care should be taken not to increase recreational densities significantly.

C. Fishing Opportunities

The possibility of developing a put-and-take fishery in the Herb Martyr area has been discussed by resource managers and proposed by some recreationists. However, in our estimation this would increase recreational use and is not justifiable. The resource base would be of marginal value for this purpose and the potential recreational benefits are outweighed by the potential impacts of increased activity in Cave Creek Canyon.

D. Information Services

Successful implementation of the first three recommendations depends largely upon improved information services for visitors. These services should include written materials to inform visitors of facility locations (in nearby areas as well as Cave Creek), the types of recreational activities provided for in each location, and, with specific reference to South Fork, Forest Service management goals and intentions should be made clear. In addition, Forest Service personnel should be available for visitor contact at the Portal Station on a regular basis. Beyond these efforts, selected informational signs and roving Forest Service personnel throughout the Cave Creek area would enhance the recreational experience for users while reducing management problems. At a minimum, an informational brochure including an area map should be available at the Portal Station.

LITERATURE CITED

Richards, Merton T., David A. King, William W. Shaw, and Daniel J. Witter. 1979. "The Economic and Social Characteristics of Non-Consumptive Wildlife Enthusiasts Visiting Southeastern Arizona." Paper presented at the Arizona-New Mexico Wildlife Society-American Fisheries Society Annual Conference, February 1-3, 1979, Silver City, New Mexico.

Shaw, William W., and David A. King. 1976. The Nonconsumptive Uses and Values of Wildlife at Selected Locations in Southern Arizona. Unpub. Research Proposal. School of Renewable Natural Resources, Univ. of Arizona, Tucson.

Shaw, William W., Daniel J. Witter, David A. King, and Merton T. Richards. 1978. "Nonhunting Wildlife Enthusiasts and Wildlife Management." Paper presented at the Western Association of Fish and Wildlife Agencies and Western Division-American Fisheries Society Annual Meeting, July 17-20, 1978, San Diego, California.

Witter, Daniel J., William W. Shaw, David A. King, and Merton T. Richards. 1978. "Nonconsumptive Wildlife Enthusiasts Visiting Southern Arizona: Their Beliefs About Wildlife Management Programs and Policies." Paper presented at the Arizona-New Mexico Wildlife Society-American Fisheries Society Annual Conference, Feb. 3-4, 1978. Douglas, Arizona.